

## Section 8

### *Force Management/Sustainment Engineering*

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The maintenance of the damage tolerant capability of an aircraft after it enters service is the function of an activity called Force Management. Recommended guidance for accomplishing the force management objectives is contained in Tasks IV and V of MIL-HDBK-1530. As this activity can be considered to be the final phase of fracture control, a brief summary of the major force management elements is presented in the following. See Berens, et al. [1981] for a more extensive earlier discussion of Force Management.

Structural maintenance activities of a fleet are initially scheduled in accordance with the Force Structural Maintenance Plan (FSMP) of Task IV. Timing of maintenance actions (inspections, repairs, modifications, or retirement) is determined from predicted crack growth for the design environmental/stress usage. Task V calls for the initial FSMP to be updated as necessary to account for unexpected critical details and changes in usage. However, the effects of usage and time can eventually produce a degree of widespread cracking and corrosion that are not accounted for in the FSMP. Because of the uncertain nature of the sizes of cracks that might be in the fleet and the need to evaluate the interactive effects of cracks in multiple elements, the FSMP assessments of the effect of potential cracks at a single location can become inadequate. When the aircraft of a fleet are experiencing widespread fatigue cracking or corrosion, are being used beyond the original life goals, or have been repaired, a change in the initial approach to maintenance planning is required. The fleet is then said to be aging according to MIL-HDBK-1530. Structural integrity is maintained in an aging fleet through a process known as sustainment. Sustainment encompasses the actual structural maintenance as well as the analyses and tests needed to plan the maintenance tasks.

The ASIP force management concept is to monitor the usage of each aircraft and compare the computed damage accumulation, as described by a crack growth analysis, with the predicted damage accumulation of a baseline usage aircraft. The maintenance schedule of the monitored aircraft is modified as necessary to account for differences of usage from the baseline. This section discusses the major elements of force management. Since the force management techniques for sustainment analysis are still being developed, a general discussion of the damage tolerance sustainment issues is also presented.